BANGLADESH
NATIONAL CONSERVATION STRATEGY

DISASTER AND DISASTER MANAGEMENT

A S M MAKSUD KAMAL
1.1. GENERAL

Long since the development of societies, human being has tried to innovate mechanisms for resisting and coping with disastrous events. The etymology of the term disaster stands to testify the use of fate to deal with hazards. The nature and intensity of hazards around the globe have been diversifying and getting stronger over the periods of time. Newer forms of hazards have been rising out day by day. The growing complexity of life, increasing population, urbanization and an overwhelming trend of globalization have put forward several challenges to deal with disaster.

Dealing with the challenges of disasters requires newer forms of solution. Today it has been proved by several incidents around the world that the task of managing disaster risks and disaster events is heavily dependent on scientific knowledge and evidence based technique. In Bangladesh, a national flood warning system provides warnings up to 10 days ahead to millions of villagers, helping them defend against the regular flooding and preserve household assets. Studies indicate savings of about US $40 for every dollar invested for this early warning system (Basher, 2013). Disaster reduction is both possible and feasible if the sciences and technologies related to natural hazards are properly applied in collaboration with indigenous knowledge, which helps to shift the practice into praxis.

Bangladesh, a lower middle income country of South Asia, is one of the highly disaster prone countries of the world. Every year the country suffers socio-economic and environmental shocks from several geophysical, hydrological, meteorological, climatological, biological and extra-terrestrial hazards. Bangladesh is one of the most natural disaster prone countries in the world, occupying the 5th position among 173 countries. The country ranks 1st in terms of vulnerability and 6th in terms human exposure to floods and cyclone in the world. Similarly, the country is highly exposed to the risk of earthquakes (17th out of 153 countries), landslides (35th out of 162) and drought (63rd out of 162 countries). The country scores 63.78 percent in vulnerability, 86.84 and 61.03 percent in lack of coping and adaptive capacities respectively (World Risk Report-2012). Bangladesh faces extreme risks of climate change and ranks 2nd on the Climate Change Vulnerability Index (European Commission, 2014). This report reveals that Bangladesh would experience the economic impacts of climate change most intensely and that its capital Dhaka would be one of the five most climate vulnerable cities in the world. Degradation of the Sundarbans mangrove forests and encroachment by the ocean with rising sea level and salinity intrusion will inevitably lead to species loss in this richly bio-diverse part of the world. Sundari trees of the Sundarbans are threatened with extinction due to excessive salinity. There has been an increase in the salinity-affected agricultural land by 22% since 1973 (SDRI, 2009). About 20 million people in the coastal areas of Bangladesh are already affected by salinity in their drinking water (World Bank, 2013). Although this was mitigated to an extent with exploitation of
groundwater, with water tables going down and arsenic contamination in some areas, the problem is assuming serious proportions.

Moreover, man-made hazard are emerging in the country. Fire hazard is increasing every year. Weak construction and non-compliance with land use regulations cause frequent collapse of buildings in Bangladesh. One of the worst building collapses in the world was the Rana Plaza disaster in Savar that occurred on 24 April 2013 killing 1,137 people and leaving hundreds of people injured. The Rana Plaza has become a ‘symbol’ of poor compliance concerning workplace safety and security in Bangladesh’s industrial sector, and an ‘icon’ of poor attention to the working condition in garment factories.

It is to be noted that Bangladesh is considered as one of the most vulnerable countries for its world’s most dense population of 160 million of which 31.5% of the total population is living at the upper poverty line and 17.60% are extreme poor. Hence, the poor in Bangladesh will face more food insecurity, water stress and health problems because of the lack of preparedness with respect to the intensity of disastrous events and rapidly changing climate that also significantly undermines the poverty reduction efforts.

The discourse of disaster management has undergone significant changes in recent decades and their effects have been profoundly felt in the developing world, particularly in terms of reduction in the loss of human lives. The concept of disaster management globally has shifted from emergency preparedness and response to a recognition that disaster risk and development are intricately linked, and the impact of poor development often created increased vulnerability that result then in development losses. Despite the relentless progress in poverty reduction and balanced economic growth for a decade of Bangladesh, development of the country remains in face of severe threats from natural disasters.
According to conservative estimations of UNISDR, annually 14 percent of GDP of Bangladesh gets exposed to disasters. The country has suffered an annual loss of 1.8% of the GDP due to natural disasters. The economic loss from disasters, as the research findings of Asian Development Bank (ADB) has demonstrated, will rise to 2% of GDP by 2050 and 9% by the end of this century.

The Sendai Framework for 2015-2030 (Sendai framework, 2015) stated the global aim of DRR as: “The substantial reduction of disaster losses, in lives, livelihoods and health and in the economic, physical, social, cultural and environmental assets of persons, communities and countries.” To attain the expected outcome, the following goal is to be pursued “Prevent new and reduce existing disaster risk through the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures that prevent and reduce hazard exposure and vulnerability to disaster, increase preparedness for response and recovery, and thus strengthen resilience”.

Attempt has made to bring about coherence between various policy instruments at global level so that the DRR/CCA goals converge with the Sustainable Development Goals that are agreed for 2015-2030. The proposal for Sustainable Development Goals (SDG) lays strong emphasis on the links between poverty eradication, development, risk reduction, climate change effects and resilience, and at least five of the 17 goals that are being discussed as part of the SDG framework have strong focus on DRR and CCA (Box 1).

**Box 1: Sustainable Development Goals (SDGs)**

**Goal 1: End poverty in all forms everywhere**
1.5 By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters

**Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable**
11.5 By 2030, significantly reduce the number of deaths and the number of people affected and decrease by [x] per cent the economic losses relative to gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations.

**Goal 13: Take urgent action to combat climate change and its impacts**
13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.
13.2 Integrate climate change measures into national policies, strategies and planning
13.3 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

**Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss**
15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world.
The introduction of three main global instruments Sendai Framework (2015), The 2030 Agenda for Sustainable Development (2015) and COP 21 (2015) as well as the presence of National Disaster Management Act (2012) open the enough scope to synergize the disaster management with the country’s long-term development. The recognition of disaster management has appeared as a whole-of-Government approach through comprehensive disaster risk management and promoting mainstreaming of climate change adaptation to eradicate poverty, ensure food security, gender equity, livelihood and environment and ecological protection with the reduction of existing and future risks. Disasters are increasingly being recognized as ‘deep rooted and longer-term problems that must be planned for’, with consequences that can be reduced and mitigated when appropriate measures are taken. Disaster management is not limited to responding to occasional shocks due to extreme events like cyclones, floods and storm surges, but it is about managing the country’s development process in a way that continuously reinforces the country’s resilience. Bangladesh recognizes this fully, as reflected in its recommendation on post-2015 framework for DRR that “Increase synergy between Sustainable Development Goals, Disaster Risks Reduction and Climate Change Adaptation.”
The 2011 Global Assessment Report of the UNISDR revealed that in terms of number of people exposed to flood, tsunami and cyclone, Bangladesh is ranked first out of 162 countries. As can be seen from the Table 2, floods, drought, cyclone and salinity constitute the largest risk to majority of the population throughout the country.

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Floods (%)</th>
<th>Flash floods (%)</th>
<th>Drought (%)</th>
<th>Cyclone, tidal surge, salinity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vulnerable land area</td>
<td>61.09</td>
<td>23.09</td>
<td>45.89</td>
<td>31.99</td>
</tr>
<tr>
<td>Vulnerable population</td>
<td>71.4</td>
<td>26.75</td>
<td>45.73</td>
<td>26.71</td>
</tr>
</tbody>
</table>

The changing nature of demography in the country is also leading to greater hazard exposure and vulnerability for people. Urban population in the country has doubled every 12 years. As increasing number of rural people migrate to urban areas in Bangladesh, the rural population exposed to flooding is expected to decline by 30 percent by 2050, while the number of people living in cities will triple. Urban disasters (flooding, earthquakes and man-made disasters like fire, building collapses, etc) will pose a formidable threat to life, infrastructure, property and economic development. Urban disasters also pose particular challenge different from disasters in rural or coastal areas, particularly because of complex maze of regulatory/governing bodies and administrative institutions that constitute our city authorities, without clearly defined roles and responsibilities.

The current status of the vulnerability and risk of various natural and man-made hazards are given below that also illustrate the degradation of the resources:

**FLOOD**

Floods are annual phenomena with the most severe occurring during the months of July and August. Regular river floods affect 30% of the country increasing in and around 70% in extreme years. The major floods that occurred in 1954, 1955, 1974, 1984, 1987, 1988, 1993, 1998, 1999, 2000 and 2007 have been very destructive and caused serious threat to lives and economy. The Multi-hazard, Vulnerability and Risk Assessment report (DDM, 2015) reveals that for return periods of 25, 50, 100 and 150 years, the projected inundation of the country is estimated to be 57.0%, 61.1%, 80.6% and 81.2% respectively. This indicates that
the area subjected to flooding has increased from 52% to 61.1% for 50 years and 68% to 80.6% for 100 year return period. The flood damage potential in Bangladesh is increasing due to climate change, urban concentration, encroaching of settlements into flood-prone areas, and overreliance on the safety provided by flood control works such as levees, reservoirs. Due to the various unplanned development work and rapid growth of settlement in rural and urban areas, the flood-water is likely to increase inundation depth and duration of flood. Statistics reveal that even though the inundation was lower in 2004 than that of 1988 and 1998 floods, the economic losses have been increasing over the years. The fatalities are also decreasing gradually. The government has been developing and implementing various measures to better equip the country to deal with floods. Important initiatives include flood action plan, flood hydrology study, flood management model study, national water management plan, national water policy, flood early warning study, construction of flood embankment and flood shelter, etc.

**STORM SURGE AND CYCLONE**

Storm surges accompanying cyclones cause the most damage in the coastal areas. Storm surges are unusual rise in seawater associated with a tropical cyclone originating in the Bay of Bengal. In the last 55 years, eighteen major cyclones devastated the coastal areas, with the most-devastating 1970 cyclone killing about 300,000 people. The most recent severe cyclone was the Cyclone Sidr in 2007 which struck the coastal region, the worst of its type since 1991, with winds of 155 miles per hour and a five-meter sea surge. Millions of people were affected, approximately one million tonnes of rice crop was lost. The economic loss caused by cyclones of 1970, 1991 and 2007 were US$ 87 million, US$1.5 billion and US$ 1.7 billion respectively, while the death toll progressively declined from 300,000 (1971) and 138,882 (1991) to 3363 in 1997, although the wind velocity for the cyclones was almost same (224 km/hr, 225 km/hr and 223 km/hr for the respective years). This shows that with the same category of cyclone, the death toll has significantly reduced but the economic cost are increasing. The mitigation and response mechanism of cyclone in Bangladesh is working well. So far, there approximately 4,000 multi-purpose cyclone shelters have been constructed against a target of 5,000. Model disaster resilient habitats have also been constructed in coastal areas. Interactive response based early warning has been established to enable coastal residents to access accurate, real time cyclone warning. Bangladesh Water Development Board (BWDB) has been taking steps to fortify and raise the coastal embankments and polders against tidal and storm surges. There are 50,000 cyclone volunteers in the coastal districts to disseminate early warning as well as search and rescue operations.

**TORNADO**

Tornadoes are identified as one of the unpredictable localized hazards in Bangladesh. They result in significant deaths, injuries and economic damage. The frequency of tornadoes in Bangladesh is similar to that in the central United States, and is among the highest in the world. Tornadoes killed at least 111 people in Mymensingh and Netrokona districts in 2004; 600 in the Jamalpur and Tangail districts in 1996; and at least 800 in the Manikganj district in 1989. The Brahmanaria tornado of 2013 struck 20 villages with a diameter of 8 km traveling at a speed of 70 km per hour, killed 31 people and injured approximately 500 in
Brahmanbaria district. Also there are severe local seasonal storms, popularly known as nor’westers (kalbaishakhki). Severe nor’westers are generally associated with tornadoes. Tornadoes are embedded within a mother thundercloud, and move along the direction of the squall of the mother storm. The frequency of devastating nor’westers usually reaches the maximum in April, while a few occur in May, and the minimum in March. Nor’westers and tornadoes are more frequent in the afternoon.

Riverbank erosion is a common problem along the major and minor rivers in Bangladesh mainly due to deltaic topography and it has been forcing people to migrate or resettle in marginal areas which are equally vulnerable, for instance mid-channel islands or chars. The rate of erosion along the major rivers may vary over time. For example, from the 1970s to early the 1990s, the mean annual erosion was about 3,300 hectares along both banks of the Jamuna River. During the last decade erosion along the river seems to have diminished slightly ranging from 1,000 to 2,500 hectare (ha) per year. Along the Jamuna, the Ganges and the Padma rivers, about 88,462 ha, 29,854 ha and 33121 ha of land have eroded respectively during the period 1973 - 2015. Bank erosion alone has rendered millions homeless and has become a severe social hazard. The majority of slum dwellers in large urban and metropolitan towns and cities are victims of riverbank erosion. Structural interventions to provide protection against riverbank erosion are very costly. Along with structural measures, less costly non-structural measures, like erosion prediction, can be used to reduce the loss due to riverbank erosion and lessen the suffering. Since 2004, predictions for morphological changes have been conducted for Jamuna, the Ganges and Padma rivers. Evaluation of the
predictions for the last few years shows a reasonably good match with the occurrences. From 2005, prediction activities were funded by the Jamuna-Meghna River Erosion Mitigation Project (JMREMP) and EMIN project of the BWDB and WARPO, and in 2008, by the UNDP. The JMREMP of the BWDB has funded the erosion prediction efforts of the last five years.

**LANDSLIDE**

In the past, landslide was not considered a major hazard in Bangladesh. However, recently landslide has emerged as a major hazard, particularly after the Chittagong Landslide of 2007. This slide caused 120 people dead. The direct losses due to the event was estimated at US$ 13.2 million while indirect losses were much more because the country's largest port was closed and the city's industries came to a standstill following the event. Thus during every monsoon, rainfall triggered landslide events are becoming common in Bangladesh. Analysis reveals that around 90mm of rainfall during 24 hours or 284mm rainfall during 48 hours could cause a landslide in Cox's Bazaar and Teknaf. Based on the threshold value of rainfall, community based early warning has been piloted in the hill districts of Cox's bazar and Teknaf. The critical locations where these warnings should be imposed have been identified through landslide hazard mapping in Cox's Bazaar and Teknaf.

**DROUGHT**

In Bangladesh drought is defined as the period when moisture content of soil is less than the required amount for satisfactory crop-growth during the normal crop-growing season. In Bangladesh, drought is seasonal - parts of Bangladesh experience drought in the crop season, namely Kharif (June/July to October) and Rabi and pre-Kharif (January to May), due to dry days and low soil moisture. Usually severe drought occurs in the northwestern districts (Barind tract) of Bangladesh. Barind Tract covers most parts of the greater Dinajpur, Rangpur, Pabna, Rajshahi, Bogra, Joypurhat and Naogaon districts of Rajshahi division. During the last 50 years, Bangladesh suffered about 20 drought episodes. The drought conditions in northwestern Bangladesh in recent decades led to a shortfall of rice production of 3.5 million tonnes in the 1990s. As much as 17% of the *aman* crop - the main paddy crops in the wet season - may be lost in a typical year due to drought.

**EARTHQUAKE**

In the last 250 years, Bangladesh has suffered from severe large earthquakes, such as the 1762 Arakan earthquake, the 1869 Cacher earthquake, the 1885 Bengal earthquake, the 1897 Great Assam earthquake, the 1918 Srimangal earthquake, 1930 Dhibri earthquake and 1950 Assam earthquake. The 1885 Bengal earthquake and 1918 Srimangal earthquake had their epicenters inside the country. Bangladesh is located in the tectonically active Himalayan orogenic belt that developed by the collision among the Indian, Arabian, and Eurasian plates. A number of active faults is suggested within the Chittagong-Tripura fold Belt, and the Madhupur blind fault on the western margin of the Madhupur tract. CDMP-I (2009) and CDMP-II (2014) developed the earthquake hazard, vulnerability and risk maps of the major earthquake prone cities of the country. Risk assessment reveals (CDMP 1, 2009)
that if an earthquake of magnitude 7.5 occurred at Madhupur fault, about 72,000 buildings would be damaged beyond repair in Dhaka city. The building related economic losses alone for such an earthquake are estimated more than US$ 6 billion. It is estimated that about 140,000 buildings would be damaged in Chittagong city due to the occurrence of an 8.5 magnitude earthquake from Plate Boundary fault located near the Teknaf-Myanmar coast. The Dauki fault having the potential of generating an 8.0 magnitude earthquake could cause the collapse of 25,000 buildings beyond repair in Sylhet city corporation areas. Scenario based earthquake contingency plan also been prepared for national, city and agency levels addressing what to do during, before and after earthquake. To address earthquake hazard, the Bangladesh National Building Code (BNBC, 1993) is in the process of updating. Out of planned 62,000, so far 32000 Urban Community volunteers received training in search, rescue and first aid through the Fire Service and Civil Defence (FSCD). The Urban Development Directorate (UDD) is promoting risk-integrated land use planning and updating the existing policy for planned urbanization.

**TSUNAMI**

After December 2004 Indian Ocean tsunami that killed more than 230,000 people and left a half million homeless in a dozen countries, people of the region came to know about tsunami hazard, though Bangladesh suffered relatively minor damage at that time. Since there was no concrete evidence of significant tsunami risk in the coast of Bangladesh, not much attention is given yet to the tsunami hazard mitigation and early warning for the country. Tsunami Inundation risk map (CDMP-I, 2009) reveals that Sundarban area, NijhumDwip, south of Hatia (outside polder) and Cox’s Bazaar coast are likely to be inundated during tsunami. Maximum inundation is seen at NijhumDwip in the range of 3-4 metres, and at Sundarban area and Cox’s Bazar coast in the range of 2-3 metres. Small islands and part of the Manpuras island in the Meghna Estuary could be inundated by 2-3 metres. Patuakhali district is low lying area which may experience inundation of up to 1-2 metres during high tides.
SALINITY

Saline water intrusion is a persistent hazard in the coastal areas of Bangladesh. Salinity intrusion has gripped some coastal districts since there is no freshwater layer up to the depth of 1,100 feet. Bangladesh Water Development Board assessed the quality and quantity of groundwater up to 1,100 feet deep in 19 coastal districts. They found saline water in aquifers within just 600-700 feet depth. Coastal districts such as, Satkhira, Bagerhat, Khulna, Barguna, Barisal, Pirojpur, Gopalganj, Nohakhali and Lakshmipur are badly affected by saline water intrusion. Seasonality control the saline water intrusion in Bangladesh, such as, in winter months the saline front begins to penetrate inland and the affected areas rise sharply from 10% in monsoon to over 40% in the dry season. Anecdotal evidence also indicates that increased salinity from saltwater intrusion poses an imminent threat to livelihoods and public health through its impacts on agriculture, aquaculture, infrastructure, coastal ecosystems, and the availability of freshwater for household and commercial use.

ARSENIC CONTAMINATION

Increasing arsenic contamination of groundwater in Bangladesh is turning out to be a major disaster for the country’s population, especially in the southwest and south east part. Out of 64 districts, 61 are seriously affected by arsenic contamination of drinking water. Seventy-five million people are at risk and 24 million are potentially exposed to arsenic contamination. The WHO recommended value of arsenic contamination in water is 0.01 mg/l, while the maximum permissible limit for Bangladesh has been fixed at 0.05 mg/l. Out of 10 million wells in the country, approximately 30% exceeds the national standard and over 50% exceed WHO’s permissible limit.

Besides natural disasters, a new trend is seen in man-made disasters like fire, building collapses, ferry capsizes which happen in the country with increasing frequency. With low labour cost, Bangladesh attracts investors to establish labour extensive industries like readymade garment (RMG), leather and footwear, ship breaking and ship building. Bangladesh’s $20 billion garment industry contributes about 15% to the total GDP and around 80%3 to national export earnings. As RMG industry is not considered to be heavy industry, proper and sufficient care is not given to its vulnerability to fire and building collapse, which are the common industrial accidents here. In one single fire incident in Savar in 2013, over 1,100 people died due to fire caused by dangerous working conditions. Due to the low-lying riverine country, being dominated by monsoon climate Bangladesh is mostly effected by the hydro-meteorological hazards. Using the Bay of Bengal in a hydrodynamic model, the World Bank estimates that cyclone exposed areas in Bangladesh will increase by 26% and the affected population will grow as high as 122% by 2050. These cyclones can have serious implications on micro and macro food production. The Multi-hazard, Vulnerability and Risk Assessment report (DDM, 2015) reveals that for return periods of 25, 50, 100 and 150 years, the projected inundation of the country is estimated to be 57.0%, 61.1%, 80.6% and 81.2% respectively. This indicates that the area subjected to flooding has increased from 52% to 61.1 % for 50 years and 68% to 80.6% for 100 year return period. During 1970-2004, Bangladesh lost an estimated amount of over half a million hectares of crop land. People identified disasters as major threat to their food security and livelihood.
Bangladesh has made considerable and significant development gains over the last 10 years with economic growth averaging 6% for the last decade, poverty decreasing from 40% in 2005 to 24.7% in 2014 and achieving five out of eight of the MDGs, all of this progress has been achieved in the face of considerable vulnerability and exposure to natural and human-induced hazards. This progress is a testament to the innate resilience of the Bangladeshi people, who continue to make developmental gains despite living with disasters and climate risk.

In order to enhance the technical capacity of the Government of Bangladesh with regard to DRR, with the support of donor agencies, the Ministry of Disaster Management and Relief (MoDMR) undertook an initiative titled Comprehensive Disaster Management Programme (CDMP) to bring about a paradigm shift in disaster management from the conventional approach of urgent response and relief to a more comprehensive and sustainable approach. Fundamentally CDMP aims to create the right environment to ensure populations at risk have a better chance at preparing for and overcoming recurrent hazards. Concerted efforts for disaster management in all sectors, availability of timely warning of impending hazards and appropriate information for adaptive measures are at the heart of such a desired approach. Phase-I of CDMP (2004-2009) laid the foundations for institutionalising the risk reduction approach and framework. The total budget for this phase was US$27.12 million. Phase II has been designed to further scale up and mainstream disaster risk reduction (DRR) and climate change adaptation (CCA) into all sectors, investing in policies and knowledge-building, and working with and through the government and disaster management committees. Donors supported more than US$70 million to this phase.

CDMP pursues the goals through the attainment of the following predetermined outcomes: I) Strong, well-managed and professional institutions capable of implementing a comprehensive range of risk reduction programmes and interventions, II) Reduced risks to rural populations through structural and non-structural interventions, empowerment of rural communities and improved awareness of, and planning for, natural hazard events, including the likely impacts of climate change, III) Reduced risk to urban populations through structural and non-structural interventions, improved awareness of natural hazard events and the piloting of urban community risk reduction methodologies targeting the extreme poor, IV) Improved overall effectiveness and timeliness of disaster preparedness and response in Bangladesh by strengthening management capacity and coordination as well as networking facilities at all levels, Better disaster-proofing of development funding across thirteen ministries, V) This will achieved by generating increased awareness of hazard risks and the provision of technical information, advisory services and resources to stimulate positive changes in planning and investment decisions over the long-term, VI) Community-level adaptation to disaster risks from a changing climate is effectively
Reduced risks to urban population through structural and non-structural interventions, improved awareness of natural hazard events and the piloting of urban community risk reduction methodologies that target the extreme poor.

Building on the successes of the first phase, CDMP phase two generates major impacts at both policy and grassroots levels. Through support to the key partner of the Ministry of Disaster Management and Relief, vital regulatory framework has been endorsed including the Disaster Management Act (2012), Disaster Management Policy (Draft), and the revision of the Standing Orders on Disasters (SOD), National Plan on Disaster Management (2010-2015), Cyclone Shelter Constructions Maintenance and Management Guidelines 2011, South Asian Association for Regional Cooperation (SAARC) Disaster Management Framework etc. Disaster management has been widely established as field of academic study in the elementary and secondary education curriculum, tertiary education degree programmes, and professional government and private training institutions.

CDMP risk reduction interventions provide direct benefit more than two million people through structural and non-structural community level projects sanctioned under the Risk Reduction Action Plan generated from Community Risk Assessment(RRAP/CRA) being financed by the innovative Local Disaster Risk Reduction Fund (LDRRF). More than half a million Cyclone Aila-affected people have better access to safe water and 20,000 households took part in cyclone wind breaker conservation by using subsidized improved stoves that used reduced amount of firewood. Expand livelihood (crop, livestock and fisheries) adaptation to climate change activities in 200 Upazilas across the 40 most vulnerable districts. Strengthen 400 farmers’ field schools to ensure their access to climate adaptive technological options.

Pilot urban risk reduction interventions has been initiated emphasizing the earthquake risk mapping and contingency plan development in densely populated locations at the 9 targeted cities. In the urban setting, land use and city physical detailed planning have been
enriched by the risk information generated from seismic hazard assessments and mapping. Risk informed land use planning has been developed for the first time in the country for Mymensingh city corporation area. Municipals risk reductions are entering the governance through the involvement of more than 140 Municipal Mayors in the ‘Safer Cities’ global campaign and training in self-assessment tools. The urban risk reduction has been strengthened with the professional training of more than 32000 volunteers on urban search, rescue and first aids as well as school safety and household response preparedness improved further. The safer school program has been institutionalised with at least twice-a-year country-wide earthquake awareness drill. Moreover, CDMP implement urban risk reduction interventions across 45 slums in Dhaka, Chittagong and Sylhet.

Around three millions of cyclone prone population benefitted from easier access to improved cyclone early warning and response through 49,215 volunteers of the Cyclone Preparedness Programme (CPP). The disaster Early Warning coverage now extended to the whole country with 24/7 access to weather advisory and prompt cautionary messages through SMS and Interactive Voice Response (IVR) system while the Disaster Management Information Centre/Network reached all sub-districts in the country. With the support of CDMP, Flood Forecasting and Warning Centre (FFWC) of Bangladesh Water Development Board now achieved capacity to forecast both following both deterministic and probabilistic method 5 Days and 30 days earlier respectively.

The disaster response coordination capabilities has been enhanced with the establishment and fully functioning state-of-the-art National Disaster Response Coordination Centre (NDRCC) that issues situation reports to all national stakeholders in the onset of every disaster event. Patterns of models for household level preparedness are emerging through household preparedness initiatives including those with disabled members. Development perspectives of Bangladesh including the Perspective Development Plan and the Five Year Plan incorporate disaster risk reduction as part of the compliance and in the Development Project Proforma. At the sectoral level, 13 key sectoral ministries and departments are integrating disaster risk reduction and climate change adaptation into their respective portfolios through CDMP interventions.

Phase I of CDMP trained over 27,000 Government officials to increase their capacity to plan and implement risk reduction at both community and national levels. Also at the community level, support to Disaster Management Committees at district, Upazila and Union Parishad levels have facilitated highly accurate disaster risk assessments, community plans, and a leveraging of indigenous knowledge to put these into place. These have been further supported through Community Risk Assessments, introduced in Phase I and now ongoing, and Risk Reduction Action Plans for local level initiatives like plinth raising to protect against flooding, which have benefited approximately 600,000 people. Phase II of CDMP support 2,000 Union Disaster Management Committees (DMC), 200 Upazila DMCs and 40 Districts DMCs to incorporate disaster risk issues into the planning process. CDMP II also supports 13 key ministries to incorporate disaster risk reduction policy into their planning and budgeting process. Initiative taken to ensure 95% of development projects meets the requirements of the ECNEC decision on risk reduction.

CDMP I and CDMP II made a considerable technical development for the sectoral and national disaster risk reduction, but strong initiative isn’t in place to institutionalize the achievements of CDMP. Moreover, technical capacity and ownership has not been
developed to a momentous level in the relevant GoB organizations and within the
government to carry-out the pilot interventions of CDMP.

Bangladesh has made a strong commitment to implement Hyogo Framework for Action
(HFA) during 2005-2015 for critical guidance in efforts to reduce disaster risk. In order to
meet the Priority Action 2 of HFA Department of Disaster Management (DDM) undertake a
project titled ‘Multi hazard Risk and Vulnerability Assessment (MRVA)’ being funded by
World Bank to identify, assess and monitor disaster risks and enhance early warning. In
continuation of this, outcome of this project “National and Local level risk assessment based
on hazard data and vulnerability information” which lead towards ‘Multi-Hazard Risk
Assessment” is in line with Priority 1: ‘Understanding Disaster Risk’ of Sendai Framework for
Disaster Risk Reduction 2015-2030, adopted in the 3rd World Conference on Disaster Risk
Reduction, held from 14 to 18 March 2015 in Sendai, Miyagi, Japan. DDM organizes regular
training to the local government elected representatives and local disaster management
committee members to make them educate on the integration and implementation of DRR
techniques in the local development plan. DDM constructs more than 100 cyclone shelters
in the coastal zone following the cyclone shelters construction guidelines.

The government use to provide very large budgetary allocation for the Ministry of Disaster
Management and Relief. The size of the budget is usually within 8th to 10th position of the
forty five ministry of the Government of Bangladesh. The total budget for the Ministry of
Disaster Management and Relief (MoDMR) has been increasing over the last four years as
shown in graph 1. In 2012-13 the total allocation was 5857 crore BDT which increased to
7440 crore BDT in the last fiscal year. This graph also shows the similar trend for the
development as well as non-development budget within the ministry.

**Graph 1: Graph 1 showing the budgetary allocation of MoDMR**

![Graph 1](image_url)

The absolute figure of MoDMR budget has been increasing over the last four years as it has
been evident from the previous graph, however, the ratio of MoDMR budget in comparison
of the total budget has been decreasing over the years. The share was 3.37 percent in 2012-
13 while it decreased to 2.52 percent in the latest fiscal year. On the other hand the share of
Budget as a percentage of GDP has also been decreasing as 0.56 percentage of GDP was devoted for MoDMR in 2012-13 which also decreased to 0.49 percentage points in the latest fiscal.

**Graph 2: MoFDM budget as % of total budget and GDP**

Percentage share of development and non-development budget in the allocation of MoDMR budget has been demonstrated in the graph 3. We could see that the percentage share of development budget has increased from 28.3 percent in 2012-13 to 31.3 percent in 2015-16. On the other hand the share of non-development budget has decreased from 71.7 percentage points to 68.7 percentage points in last four years. The increment in development budget means that the DRR activities are increasing in ministry programme though such advancement is very narrow and slow.

**Graph 3: % of development and non-development budget in MoDMR**

One of the big non-development allocation in the budgetary provision is the safety net programme. The Government of Bangladesh (GoB) has extensive and well-established safety net and social protection programme targeting the poor and vulnerable. The prime
The objective of safety net project is to reduce the vulnerability of the people at risk. The main programmes covered under social safety net programmes (SSNPs) are: Food for Works (FFW), Employment Generation Programme for the Poorest (EGPP), Vulnerable Group Development (VGD), Vulnerable Group Feeding (VGF), old-age allowances, allowances for retarded people, allowances for widow and distressed women, grants for orphanages, besides micro-credit programmes, and allowances for freedom fighters. The average annual spend on various safety net programme is about 2.1-2.3 per cent of GDP, and for the current year (2014-15) it is US$3.9 billion (2.3% of GDP). While some of the social protection budget is earmarked for various welfare programmes and rural development and agricultural programmes, almost a fifth - US$ 745 million (19 percent of the budget of social safety net)- is earmarked for various activities implemented through the Department of Disaster (DDM), as can be seen from the following Graph 4 and Table (Table 1). Graph 4 illustrates the to reduce the vulnerability of the poor through the implementation of DRR activities of MoDMR with respect to the total safety net.

![Graph 4](image)

**Table 2:**
**Safety net and social protection budget, DDM component, 2014-2015**

<table>
<thead>
<tr>
<th>Programme</th>
<th>Budget (Taka)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Vulnerable Group Feeding</td>
<td>14,192.20 million</td>
</tr>
<tr>
<td>2 Test Relief (food)</td>
<td>12,923.70 million</td>
</tr>
<tr>
<td>3 Gratuitous Relief</td>
<td>2,838.40 million</td>
</tr>
<tr>
<td>4 Food for Work</td>
<td>13,177.40 million</td>
</tr>
<tr>
<td>5 Employment Generation Programme for the Poorest</td>
<td>15,000.00 million</td>
</tr>
<tr>
<td>Total (TK)</td>
<td>58,131.70 million</td>
</tr>
<tr>
<td>Total (US$) (^{1})</td>
<td>US$ 745 million</td>
</tr>
</tbody>
</table>

(Source: Government of the Republic of Bangladesh, Ministry of Finance. Social Safety Net Programme)
This significant volume of resource which has been provided through the Ministry of Disaster Management and Relief (MoDMR) every year over the past three decades. But there has not been any systematic impact evaluation of this work and so it is very difficult to know how this fund is helping to promote disaster preparedness, risk and vulnerability reduction. Given that the average annual loss and damage suffered by the country due to various disasters stands at about US$500 million, a logical assumption would be that, at least theoretically, the MoDMR component alone is creating net assets in communities to the value of about US$250 million. Each of the 485 Upazilas, if the above were correct, would be adding assets worth US$ 515,000 (Tk. 4 crores) every year which could significantly contribute to disaster risk reduction and resilience at community level.
The Ministry of Disaster Management and Relief (MoDMR) of the Government of Bangladesh (GoB) acts as the nodal agency coordinating disaster management (DM) in the country, under the overall direction of the National Disaster Management Council (NDMC), headed by the Prime Minister. MoDMR is committed to mainstream DRR and CCA into strategies, policies, planning, and development programmes at all levels by 2021 as part of paradigm shifts in disaster management. The Sixth Five year Plan (2011-2015) and National Sustainable Development Strategy (NSDS-2010-2021) integrated DRR as strategic key priority area. To address risks posed by natural hazards and climate change for the vulnerable population, the Sixth Plan aims at significantly strengthening the social protection programmes. This plan focused on DRR in order to reduce the sufferings of the community people in case of any disaster. This has become an important stepping stone to ensure that development project and programme outcomes are disaster resilient, and they do not increase or add any new risks to the communities. To manage the paradigm shift in disaster management, a disaster management regulatory framework is established and in which work of Ministries, Departments, NGOs and civil society are undertaken. The regulatory framework provides the relevant legislative, policy and best practice framework under which the activity of Disaster Risk Reduction (DRR) and Emergency Response Management (ERM) in Bangladesh is managed and implemented. The framework is comprised of:

- Disaster Management Act 2012
- Standing Order on Disaster, 2010
- National Plan for Disaster Management (2010-2015)
- National Disaster Management Policy, 2015
- Cyclone Shelter Construction, Maintenance and Management Policy 2011
- Guidelines for Government at all Levels (Best Practice Models).
Flow diagram given below illustrates the Disaster Management regulatory framework of Bangladesh.

**Flow diagram illustrating the disaster management regulatory framework**

With the advent of Disaster Management ACT (DMA, 2012) and as part of the reorganizations process of the Paradigm shift in Disaster management, Disaster Management and Relief Division of the Ministry of Food and Disaster Management got its own full-fledged ministry, the Ministry of Disaster Management and Relief. Following the enactment of DMA 2012, two separate directorates– the Disaster Management Bureau (DMB) and the Directorate of Relief and Rehabilitation (DRR) were merged into one and is now known as Department of Disaster Management (DDM) under the MoDMR with a more robust and wider role focusing on comprehensive disaster management and became responsible for implementation of the national disaster management related policies and plans at all levels. The DM Act 2012 gives a strong mandate for ensuring that disaster management is integrated into the core business of the entire Government, and not seen as a sector specific to one Ministry, though MoDMR holds an overall responsibility for facilitation and coordination as the ‘Secretariat’ to the National Disaster Management Council (NDMC) headed by the Prime Minister.

In order to ensure a whole-of-Government approach to disaster management integrating disaster risk reduction, climate change adaptation (CCA) and preparedness in conventional disaster response and post-disaster recovery, the GoB revised its Standing Orders on Disaster (SOD) in 2010. The revised Standing Orders on Disaster (SOD) has created provisions to expand and strengthen the disaster management institutional framework. The present edition is a substantial improvement over the previous editions. New features introduced in this edition include, among others, the following: 1) an outline of disaster management regulative framework, 2) an introduction of core groups for emergency response at various levels, 3) a new section on multi-agency disaster incident management system, 4) an introduction of risk reduction roles and responsibilities for all committees and
agencies, 5) new outlines for local level plans, 6) revised storm surge warning signals, 7) a report on cyclone shelter design, 8) revised D Form to measure the detailed local level damage and loss of the disastrous event 9) new information of specific roles and responsibilities relating to earthquake and tsunami hazards, 10) a comprehensive approach emphasizing risk reduction as well as emergency responses relating to all hazards and all sectors. Consequently, it has to be followed not only during disasters, but also at normal times. In order to meet the objective of GoB to integrate and implement DRR in development plan as well as to response in potential hazards, following (BoX-2) are the committees to work in all levels.

**Box 2: Disaster Management Committee in all levels as of SOD**

<table>
<thead>
<tr>
<th>Level</th>
<th>Summary</th>
</tr>
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</table>
| **National Level Bodies** | **National Disaster Management Council (NDMC)** headed by the Prime Minister to formulate and review the disaster management policies and issue directives.  
**Inter-Ministerial Disaster Management Co-ordination Committee (IMDMCC)** headed by the Minister for Food and Disaster Management to implement disaster management policies and decisions of NDMC/Government.  
**National Disaster Management Advisory Committee (NDMAC)** headed by an experienced person nominated by the Prime Minister.  
**Cyclone Preparedness Programme Implementation Board (CPPIB)** headed by the Secretary, MoFDM, to review the preparedness activities at the initial stage of an impending cyclone.  
**Disaster Management Training and Public Awareness Building Task Force (DMTATF)** headed by the Director General of the Disaster Management Bureau (DMB) to co-ordinate disaster related training and public awareness activities of the government, NGOs and other organisations.  
**Focal Point Operation Coordination Group of Disaster Management (FPOCG)** headed by the Director General of the DMB to review and co-ordinate the activities of various departments and agencies working on disaster management and also to review the contingency Plan prepared by relevant departments.  
**NGO Coordination Committee on Disaster Management (NGOCC)** headed by the Director General of the DMB to review and co-ordinate the activities of NGOs working on disaster management.  
**Committee for Speedy Dissemination of Disaster Related Warning/Signals (CSDDWS)** headed by the Director General of the DMB to examine, ensure and identify the ways and means for speedy dissemination of warnings and signals to the population at risk. |
| **Sub-National Level Bodies** | **District Disaster Management Committee (DDMC)** headed by the Deputy Commissioner (DC) to co-ordinate and review the disaster management activities at the district level.  
**Upazilla Disaster Management Committee (UZDMC)** headed by the Upazilla Nirbahi Officer (UNO) to co-ordinate and review the disaster management activities at the Upazilla level.  
**Union Disaster Management Committee (UDMC)** headed by the Chairman of the Union Parishad to co-ordinate, review and implement the disaster management activities at the Union Parishad level. |
management activities of the concerned union.

**Pourashava Disaster Management Committee (PDMC)** headed by the Chairman of Pourashava (municipality) to co-ordinate, review and implement the disaster management activities within its area of jurisdiction.

**City Corporation Disaster Management Committee (CCDMC)** headed by the Mayor of City Corporations to co-ordinate, review and implement the disaster management activities within it area of jurisdiction.

The Bangladesh National Plan for Disaster Management is a strategic (NPDM, 2010-2015) document, a first-ever comprehensive five year plan that provides the overall guideline for the relevant sectors and the disaster management committees at all levels to prepare and implement their area of mandate’s specific plans. The NPDM was based on the South Asian Association for Regional Cooperation’s (SAARC) disaster management framework. The Bangladesh Perspective Plan 2011-2021, Sixth Five Year Plan 2011-2015 and National Sustainable Development Strategy (NSDS) have provisions and emphasis to implement NPDM. The National Plan for Disaster Management (NPDM, 2010-2015) was rooted in the priorities for action agreed by the GoB in the 2005 World Conference on Disaster Reduction, such as, 1) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation, 2) Identify, assess and monitor disaster risks and enhance early warning, 3) Use knowledge, innovation and education to build a culture of safety and resilience at all levels, 4) Reduce the underlying risk factors, 5) Strengthen disaster preparedness for effective response at all levels. The plan were consist of seven strategic goals, as:

- **Goal 1** - Professionalizing the disaster management system
- **Goal 2** - Mainstreaming risk reduction
- **Goal 3** - Strengthening institutional mechanisms
- **Goal 4** - Empowering ‘at risk’ communities
- **Goal 5** - Expanding risk reduction programming
- **Goal 6** - Strengthening emergency response systems
- **Goal 7** - Developing and strengthening networks.

The National Disaster Management Council (NDMC) as shown in box 2, headed by the Prime Minister, is the supreme body for providing overall direction for DM. The NPDM which is based on SOD and is aligned with the DM Act is thus not a plan for the Ministry of Disaster Management and Relief (MoDMR) but of the entire GoB, though the MoMDR has an overall coordinating and facilitating role as ‘Secretariat’ to the Council.

National Disaster Management Policy, 2015 is formulated and approved to define the national perspective on disaster risk reduction and emergency management, and to describe the strategic framework, and national principles of disaster management in Bangladesh. It is strategic in nature and describes the broad national objectives, and strategies in disaster management.

The MoDMR approved Cyclone Shelter Construction, Maintenance and Management Guideline 2011, officially gazetted in February 2012. This guideline categorically outlines the criteria for selection of location for construction of new cyclone shelters, designs for construction of cyclone shelters and essential facilities that need to be provided in the
Guidelines at all levels of Government are developed as best practice models, and are used to assist Ministries, NGOs, disaster management committees and civil society in implementing disaster risk management. Guidelines will include among others:

- Disastre Impact and Risk Assessment Guideline
- Local Disaster Risk Reduction Fund Management Guidelines
- Emergency Fund Management Guidelines
- Indigenous Coping Mechanism Guidebook
- Community Risk Assessment Guidelines
- Damage and needs Assessment Methodology
- Hazard Specific Risk Assessment Guidelines
- Emergency Response and Information Management Guideline
- Contingency Planning Template
- Sectoral Disaster Risk Reduction Planning Template
- Local Level Planning Template
- National Risk Reduction Fund Management Guideline
- National Disaster Reduction and Emergency Fund Management Guideline
- Local Disaster Management Fund Guideline
- Guideline for road and Water Safety
- Guideline for Industrial safety
- Guideline for Disaster Shelter Management
- Monitoring and Evaluation Guideline for the Implementation of the Plan
- Guideline for International Assistance in Disaster Emergency

The inter-linkages between various regulative instruments and programming for implementation.
Mainstreaming risk reduction efforts within government, NGOs and private sector is viewed as being the key to achieving sustainable all hazards risk reduction interventions across the whole country. In Bangladesh mainstreaming is seen in much the same light as poverty reduction in that it is the outcome of many top down and bottom up interventions. These are summarized below and articulated briefly within Figure 15.

8.2.1 Advocacy: Awareness raising among Political, Senior Policy and Government Department Officials, Media and Academic Institutions is a priority strategy for building knowledge and understanding on the benefits of risk reduction and the roles these organizations play in implementing risk reduction programmes.

8.2.2 Policy and Planning Reform: A significant review of disaster management and development planning policy is being undertaken to ensure that they facilitate mainstreaming and promote a comprehensive risk reduction culture.

8.2.3 Capacity Building: This strategy has targeted a complete review of the roles and responsibilities of disaster management committees (DMCs) at all levels to ensure they reflect risk reduction as well as emergency response functions. A national
training curriculum is being developed to ensure that committees receive capacity building training to ensure they understand and can fulfill their functions effectively.

8.2.4 **Planning Frameworks:** Disaster management planning at all levels is being significantly overhauled to ensure that DMC plans accommodate risk reduction mainstreaming at all levels.

8.2.5 **Uniform CRA Guidelines:** Uniform CRA processes are being established to ensure consistency in the conduct of community risk identification and compatibility with the risk reduction planning processes off the respective DMCs. The guidelines also have steps to ensure strong linkages with scientific analysis information.

The roll-out of the Disaster Management Act 2012 and SOD 2010 from the national to local level has faced challenges. Many actors at the local level are not aware of either of these regulatory documents or the roles and responsibilities of various actors. The monitoring mechanisms of the DRR planned activities at local level are insufficient, as the Local level development plans are not fully designed to integrate risk management. There is still a need to raise awareness at the local level on DRR strategic documents, as these have not been well communicated to all stakeholders.

As DM is seen as a multi-sectoral and multi-functional discipline, with responsibility for delivery vested in multiple Ministries and Agencies, the NDMC comprises the following members (Box 1).

**Disaster Management Act 2012**
The Disaster Management Act (DMA) 2012 was approved by the Parliament on September 2012 after a long collective effort by the government and development and civil society actors to create a legislative tool under which disaster and emergency management will be undertaken. It has placed mandatory obligations and responsibilities on ministries and committees, and ensures transparency and accountability in the overall disaster management system.
The objectives of the Act are substantial reduction of the overall risks of disasters to an acceptable level with appropriate risk reduction interventions; effective implementation of post disaster emergency response; rehabilitation and recovery measures; provision of emergency humanitarian assistance to the most vulnerable community people; strengthening of institutional capacity for effective coordination of disaster management involving government and non-government organisations, and establishing a disaster management system capable of dealing with all hazards for the country.

The DMA will help in promoting a comprehensive disaster management programme upholding the all-hazard, all-risk and all-sector approach where risk reduction as a core element of disaster management has equal emphasis with emergency response management with greater focus on equitable and sustainable development.

Draft National Disaster Management Policy

The draft National Disaster Management Policy provides that the Disaster Management Vision of the Government of Bangladesh is to reduce the risk of people, especially the poor and the disadvantaged, from the effects of natural, environmental and human induced hazards, to a manageable and acceptable humanitarian level, and to have in place an efficient emergency response system capable of handling large scale disasters. The Mission is to bring a paradigm shift in disaster management from conventional response and relief practice to a more comprehensive risk reduction culture. The Overall Objective is to strengthen the capacity of the Bangladesh disaster management system to reduce unacceptable risk and improve response and recovery management at all levels. Recently, Ministry of Disaster Management and Relief, with the assistance of experts and stakeholders, redrafted the National Disaster Management Policy, which made provision to mainstream disaster risk reduction into public-private partnership. The policy has made references to relevant sectoral policies, operational guidelines and procedures.
<table>
<thead>
<tr>
<th>Issue</th>
<th>Action</th>
<th>Implementing Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timely warning against hazards: Cyclones and tidal surge</td>
<td>BMD and SPARRSO to be vigilant on effective monitoring of weather and issuance of timely warning against disasters like cyclone and tidal surges. Improvement of technology and expertise.</td>
<td>Ministry of Defence</td>
</tr>
<tr>
<td>Flood</td>
<td>Warning against flood through constant monitoring on water levels of sensitive rivers. Improvement of technology and expertise.</td>
<td>MOWR in collaboration and initiative of BWDB, SPARRSO, BMD</td>
</tr>
<tr>
<td>Relief and rehabilitation Preparedness</td>
<td>Preparedness in accordance with 1999 Standing Orders for Disaster with funds and materials to render immediate relief and take steps for rehabilitation of affected people.</td>
<td>MOFDM, DMB, District and Thana Administrations</td>
</tr>
<tr>
<td>Co-ordination</td>
<td>Steps to be taken to co-ordinate the efforts of Government organizations, Bangladesh Red Crescent Society and NGOs in relief and rehabilitation works to avoid duplication and unhealthy competition.</td>
<td>DMB, Cabinet Secretary</td>
</tr>
<tr>
<td>Flood Control measures</td>
<td>Steps to be taken to implement short, medium and long term measures recommended in the National Water Management Plan 2001</td>
<td>MOWR, LGD</td>
</tr>
<tr>
<td>Regional Cooperation</td>
<td>Establish contact within SAARC countries to exchange data on weather, water level in common rivers and joint efforts on disaster management.</td>
<td>MOWR, MOFA, JRC</td>
</tr>
<tr>
<td>EIA of development projects</td>
<td>Embankment and road construction schemes to be subjected to EIA, particularly to assess effect on drainage, flooding and erosion</td>
<td>Agencies preparing projects in cooperation with MOEF</td>
</tr>
<tr>
<td>Coastal accretion</td>
<td>Coastal accretions and erosions to be monitored at regular intervals. A long-term strategic plan for newly accreted</td>
<td>MOL in collaboration with SPARRSO, MOL with initiative of</td>
</tr>
<tr>
<td>Issue</td>
<td>Action</td>
<td>Implementing Agency</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Lands</td>
<td>lands should be prepared</td>
<td>MOEF and FD</td>
</tr>
<tr>
<td></td>
<td>Newly accreted land in the coastal belt to be allotted to the Forest Department for afforestation.</td>
<td>MOL and MOEF</td>
</tr>
<tr>
<td>Disaster management</td>
<td>A permanent body and network to be established for disaster management.</td>
<td>MOFDM in consultation and collaboration with MOEF, MOD, M.O.Communicaions and NGOs</td>
</tr>
<tr>
<td>Settlement policy and regulation</td>
<td>Policy and regulation to be formulated and introduced on settlement in the sensitive areas (Land Zoning).</td>
<td>MOL in consultation and collaboration with LGD, MOW, MOFDM and MOHFW</td>
</tr>
</tbody>
</table>
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